Los Alamos Material Properties

Charles L. Mader

The Los Alamos Dynamic Material Properties data volumes were collected and published by the UC Press in the early 1980s. All of the data volumes went out of print in September 1999. The seven volumes of Los Alamos Dynamic Material Properties have now been made available as PDF files on a CD-ROM. The entire collection can be searched using Adobe Acrobat 4.0 or Adobe Exchange 3.0. Over 80 copies of the CD-ROM have been requested by laboratory staff members.

The Los Alamos National Laboratory library is preparing to make the entire data volume collection available on their electronic publications web site.

The data in these volumes established the basis for many sophisticated material models that have been developed at Los Alamos. However, some of the experimental observations contained therein have never been adequately explained. Easy access to this data should stimulate renewed interest in these areas.

The Los Alamos Series on Dynamic Material Properties consists of the following data volumes.

LASL SHOCK HUGONIOT DATA, edited by Stanley P. Marsh

This data collection includes the experimentally measured equation-of-state data for 450 solids, liquids, gases and explosives in the 500-atmosphere to several megabar range.

LASL EXPLOSIVE PROPERTY DATA, edited by Terry Gibbs and A. Popolato

This volume contains the physical properties, chemical properties, detonation velocity, metal plate push data and shock initiation data for fifty commonly used high-performance explosives that were studied at the Los Alamos National Laboratory.

LOS ALAMOS EXPLOSIVE PERFORMANCE DATA - edited by C. L. Mader, J. N. Johnson, and S. L. Crane

Explosive performance, as measured by plate acceleration data, aquarium data, and detonation velocity data, is presented for many explosives and geometries of interest.

LOS ALAMOS SHOCK WAVE PROFILE DATA, edited by Charles E. Morris

This data collection includes 300 shock wave profiles of elements, compounds, minerals, plastics, explosives, and propellants generated using capacitor gages, quartz gages, Manganin gages, and the electromagnetic probe.

LASL PHERMEX DATA, VOLUMES 1, 2, 3 - edited by Charles L. Mader

The x-ray machine PHERMEX was used to study materials under a variety of shock conditions that could not be studied by other techniques. The processes investigated include jet formation, dynamic fracture, Munroe jets, reflected shocks resulting from colliding detonations, phase change, Mach and regular reflections in metals and explosives, explosive desensitization by pre-shocking and Taylor instabilities.

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